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IS 7262 (1996): Turning Mandrels [PGD 2: Machine Tool Elements and Holding Devices]



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भारतीय मानक
खरादन मैड्रल – विशिष्टि
(पहला पुनरीक्षण)

Indian Standard
TURNING MANDRELS — SPECIFICATION
(*First Revision*)

ICS 25.060.20

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

October 1996

Price Group 2

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Machine Tools Elements and Holding Devices Sectional Committee had been approved by the Production Engineering Division Council.

This Indian Standard was first issued in 1974. The present revision has been taken up to bring the standard in line with current practice. The dimensions have been completely modified and dimensions of turning mandrels other than those given in the text of standard have been deleted.

A uniform gradation of the tapered length of lathe mandrels with oversize (l_o), taking into account the fact that the length to lathe mandrel diameter ratio decreases from $l_o = 0.6d$ to $0.34d$, resulted in only minor variations to the overall length of taper l_2 and to the length of the lathe mandrel l_1 .

The manufacturing tolerances of the mounting taper of $\pm 1/2$ IT5 had to be altered to js3, as otherwise the requirements for determining the taper cannot be met. A taper tolerance of js3 permits, for the various nominal diameters, an axial displacement on the following scale:

Nominal Diameter d	over	-	3	6	10	18	50	80
	to	3	6	10	18	50	80	100
Axial displacement	$\pm$	1.8	2.25	2.5	3	5	6.25	7.5

In addition, the information on surfaces and details of the permissible peak-to-valley height has been revised.

While preparing this revision assistance has been derived from DIN 523 : 1974 'Lathe mandrels — Mandrels for work-piece—Mounting' issued by Deutsches Institut für Normung (DIN).

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

TURNING MANDRELS — SPECIFICATION

(First Revision)

1 SCOPE

This Indian Standard covers the requirements for turning mandrels used for holding work pieces having bore length ranging up to 1.5 times the nominal diameter of bore within the tolerance zones J6, H7 and G6.

2 REFERENCES

The following standards contain provisions, which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	Title
2473 : 1975	Dimensions for centre holes (<i>first revision</i>)
4432 : 1988	Case hardening steels (<i>first revision</i>)
5517 : 1993	Steels for hardening and tempering (<i>second revision</i>)

3 DIMENSIONS

3.1 Dimensions for turning mandrels shall be as given in Table 1.

3.2 Determination of Taper Dimensions — The basic values for the taper diameter d_4 , d_5 , and d_6 are the limiting values of ISO tolerance grades J6, H7 and G6. Here, d_4 = minimum size for tolerance grade J6, d_5 = minimum size for tolerance grade H7 and d_6 = maximum size for tolerance grade G6.

Over the length l_6 , the mandrels are undersized in relation to the minimum size for tolerance grade J6 to allow for positive mounting of items with a length of bore $1.5 \times d$. $l_6 + z \geq 1.5d$.

Length l_9 is oversized in relation to the maximum size for tolerance grade H7, thus permitting evenbores made to the maximum size for H7 to be securely mounted.

The other dimensions shall be as given in Table 2.

4 MATERIAL

The turning mandrels shall be manufactured from Case hardening steel conforming to IS 4432 : 1988 or oil hardening steel conforming to IS 5517 : 1993. For smaller size of mandrels up to 14 mm, a suitable alloy steel may be used.

5 HARDNESS

The hardness of turning mandrels shall be 720 HV (≈ 61 HRC) minimum and Case hardened to a depth of 0.6 mm to 0.8 mm.

6 DESIGNATION

Turning mandrels shall be designated by nominal diameter (d) and number of this standard.

Example:

A turning mandrel of nominal diameter $d = 14$ mm shall be designated as:

Turning Mandrel IS 7262 14

7 MARKING

7.1 Turning mandrels shall be marked with the nominal diameter and the manufacturer's name or trade-mark on the cylindrical surface opposite the flat at the end nearest the small taper diameter (Fig. 1).

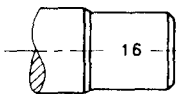


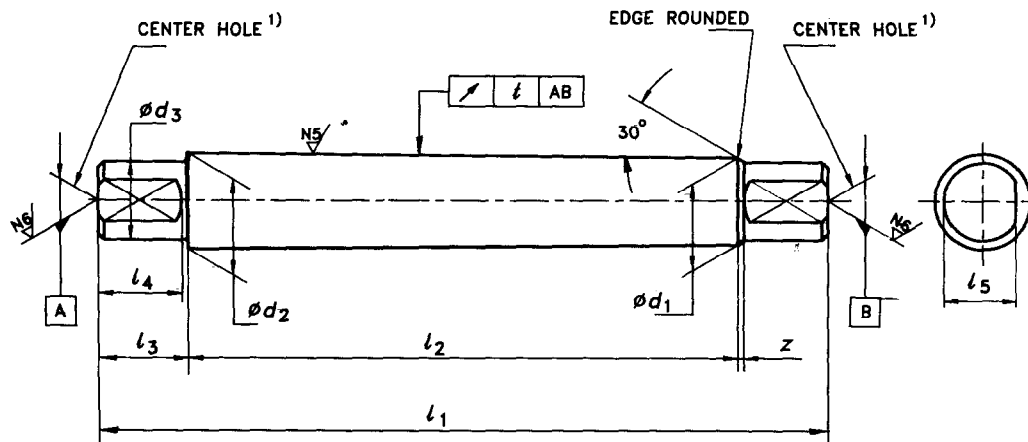
FIG. 1 MARKING ON TURNING MANDREL

7.2 BIS Certification Marking

The product may also be marked with Standard Mark.

7.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Table 1 Dimensions for Turning Mandrels
(Clause 3.1)

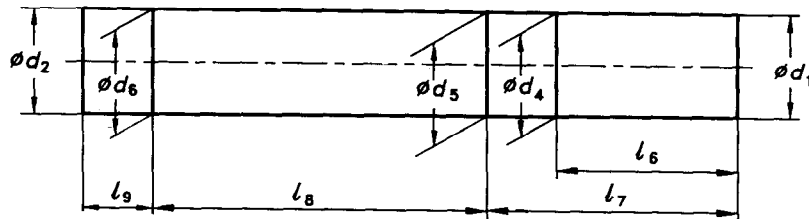


All dimensions in millimetres.

Nominal Diameter d		d_1	d_2	d_3	l_1	l_2	l_3	l_4	l_5	t	z	Reduction of Diameter Over 100 mm
Over	To	js3	js3									
—	3	$d-0.006$	$d+0.013$	2.5	55	34.5	10	9	—	0.003	0.5	0.055
3	4	$d-0.007$	$d+0.017$	2.8	65	44.5	10	9	—			
4	6	$d-0.009$	$d+0.018$	3.7	70	49.5	10	9				
6	8	$d-0.010$	$d+0.022$	5.7	85	64.5	10	9	5	0.003	0.5	0.05
8	10	$d-0.011$	$d+0.023$	7.5	93	68.5	12	11	6.8			
10	14	$d-0.015$	$d+0.028$	9	115	86	14	13	8			
14	18	$d-0.018$	$d+0.029$	13	125	94	15	14	12	0.003	1	
18	22	$d-0.018$	$d+0.032$	16	165	126	18.5	17	14	0.004	2	0.04
22	26	$d-0.020$	$d+0.033$	20	175	133	20	18	17			
26	30	$d-0.022$	$d+0.034$	24	190	140	24	22	21			
30	34	$d-0.025$	$d+0.041$	28	220	165	26	24	25	0.004	3	0.04
34	38	$d-0.028$	$d+0.042$	28	230	174	26.5	24	25			
38	42	$d-0.030$	$d+0.042$	36	240	181	28	26	32			
42	50	$d-0.035$	$d+0.044$	36	260	197	30	28	32			
50	60	$d-0.040$	$d+0.050$	42	305	226	37	35	37	0.005	5	0.04
60	70	$d-0.046$	$d+0.051$	42	330	243	41	39	37			
70	80	$d-0.052$	$d+0.052$	60	360	261	47	44	53			
80	90	$d-0.058$	$d+0.058$	60	400	293	51	48	53	0.006	5	0.04
90	100	$d-0.064$	$d+0.060$	60	430	311	57	54	53			

¹⁾ Centre holes up to 6 mm nominal diameter according to Type A of IS 2473 : 1975 and over 6 mm nominal diameter according to Type B of IS 2473 : 1975.

Table 2 Taper Dimensions
(Clause 3.2)



All dimensions in millimetres.

Nominal Diameter d		d_4	d_5	d_6	l_6	l_7	l_8	l_9
Over	To		js3					
-	3	$d-0.004$	d	$d+0.010$	3.7	11	21.7	1.8
3	4	$d-0.003$	d	$d+0.012$	7.3	12.8	29.1	2.6
4	6				10.9	16.4		4
6	8	$d-0.004$	d	$d+0.015$	12	20	40	4.5
8	10				14	22		6.5
10	14	$d-0.005$	d	$d+0.018$	20	30	48	8
14	18				26	36		10
18	22	$d-0.005$	d	$d+0.021$	32.5	45	70	11
22	26				37.5	50		13
26	30				42.5	55		15
30	34	$d-0.006$	d	$d+0.025$	47.5	62.5	85	17.5
34	38				55	70		19
38	42				60	75		21
42	50				72.5	87.5		24.5
50	60	$d-0.006$	d	$d+0.030$	85	100	100	26
60	70				100	115		28
70	80				115	130		31
80	90	$d-0.006$	d	$d+0.035$	130	145	117.5	30.5
90	100				145	160		33.5

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This Indian Standard has been developed from Doc : No. PE 02 (0078).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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